

## Modeling the optical radiation of the precataclysmic variable SDSS J212531-010745

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### Abstract

© 2015, Pleiades Publishing, Ltd. Optical observations are analyzed to derive a set of basic parameters for the precataclysmic variable star SDSS J212531-010745, whose primary is a PG1159-type star. Spectroscopic and multiband photometric observations of the star were performed in 2008–2011 with the 6-m telescope and the Zeiss-1000 telescope of the Special Astrophysical Observatory. The shape of the binary's orbital light curves is nearly sinusoidal, with the amplitude increasing with wavelength from  $\Delta m = 0.40m$  in the B band to  $\Delta m = 0.73m$  in the R band. The spectra contain absorption lines of HeII and neutral atoms, along with HII, HeI, CII, MgII, FeII emission lines, whose intensity increases synchronously with the brightness of the system. The optical radiation from SDSS J212531-010745 has a composite nature, corresponding to a model for a pre-cataclysmic variable with strong reflection effects. Cross-correlation techniques are used to measure the radial velocities and derive the component masses. Numerical modeling of the binary's light curves, radial velocities, and spectra is performed, and a complete set of parameters determined. Considerable abundance anomalies (to 1 dex) were detected for the secondary. The primary's characteristics correspond to the evolutionary predictions for DAO dwarfs with masses  $M \approx 0.5 M_{\odot}$ , and the secondary's characteristics to low-mass, main-sequence stars with the solar metallicity.

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